.Docket No. 002664-15

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| In re Patent Application of: | ) | |
| Matthias BOLTZE et al. | ) | Group Art Unit: 2836 |
| Application No. 10/828,496 | ) | |
| Filed: April 21, 2004 | ) | Examiner Michael Rutland Wallis |
| For: VEHICLE ELECTRICAL SYSTEM WITH FUEL CELL AND PROCESS FOR OPERATING AN ELECTRICAL CONSUMER IN SUCH A VEHICLE ELECTRICAL SYSTEM | ) | Confirmation No. 4305 |

# APPEAL BRIEF

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Commissioner for Patents
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Alexandria, VA 22313-1450

Sir:

The following is presented in furtherance of the appeal instituted by the Notice of Appeal filed October 10, 2007, in connection with the above-captioned patent application.

## (i) Real Party in Interest

The assignee, Webasto AG of Stockdorf, Germany is the real party in interest.

## (ii) Related Appeals and Interferences

There are no related appeals or interferences.

## (iii) Status of Claims:

Claims 1-3 and 5-11 are pending in the application. Claims 1-3 and 5-11 have been finally rejected and are the subject matter of this appeal. Claim 4 has been cancelled.

(iv) Status of Amendments

No amendments were filed subsequent to the final rejection.

(v) Summary of Claimed Subject Matter

A vehicle electrical system, including a fuel cell auxiliary power unit (Figs. 1-2, element 10) and a DC/DC converter (Figs. 1-2, element 12) for matching the DC voltage (Figs. 1 & 2, elements 22 and 24) generated by the fuel cell to the voltage (Figs. 1 & 2, elements 28 and 30) of the vehicle electrical system, the DC/DC having an input (Figs. 1 & 2, element 16) connected to an output (Figs. 1-2, elements 22 and 24) of the fuel cell, a first output (Figs. 1 & 2, element 26) for delivering converted electrical power (paragraph [0021], page 4) and a second output (Figs. 1 & 2, element 18) for delivering unconverted electrical power (paragraph [0022], page 4), wherein at least one electrical consumer (Fig. 2, element 14) is connected to said second output (18) so that some of the electrical power delivered from the fuel cell is supplied to the at least one electrical consumer without conversion by the DC/DC converter (paragraph [0023], page 2).

A process for operating an electrical consumer (Fig. 2, element 14) with electrical power, including delivering a DC voltage generated by a fuel cell auxiliary power unit (Figs. 1-2, element 10) to a DC/DC converter (Figs. 1 & 2, element 12 via lines 22 and 24), using said DC/DC converter (10) for converting a portion of the DC voltage generated by the fuel cell auxiliary power unit to a voltage that is matched to the voltage of the vehicle electrical system (paragraph [0021], page 4), and providing some of the electrical power delivered from the fuel cell auxiliary power unit to at least one electrical consumer (paragraph [0023], page 4, via output 18 to element 14 in Fig. 2) via said DC/DC converter without conversion by the DC/DC converter (paragraph [0023], page 4).

In the process, the fuel cell is connected to an input of the DC/DC converter so that all the useful electrical power delivered from the fuel cell is supplied to the input of the DC/DC converter (paragraph [0008], page 2), and some of the electrical power delivered from the fuel cell is taken from an unconditioned output of the DC/DC converter without conversion by the DC/DC converter (paragraph [0008], page 2). In the vehicle electrical system and process, the at least one consumer is a high wattage consumer (paragraph [0023], page 4),

including a compressor motor of an electrically driven air conditioning compressor of a motor vehicle climate control system (paragraph [0023], page 4), and the fuel cell auxiliary power unit has an electrical wattage of about 5 kW (paragraph [0011] page 3 and paragraph [0021], page 4). In the process, the wattage of the air conditioning compressor is controlled independently of the rpm of the compressor motor via the mechanical triggering of the compression stroke (paragraph [0010], last sentence of paragraph [0023], page 5).

In addition, the invention includes recognition that, with the invention, it "is possible to connect the fuel cell only to the DC/DC converter.... [so that] no additional circuitry measures are necessary in the area of the fuel cell" (paragraph [0008], page 2).

(vi) Grounds of the Rejection to be Reviewed

Claims 1, 2, 5-8, and 11 have been rejected under 35 U.S.C. § 103 as being obvious over Raiser (U.S. Patent 6,177,736) in view of Jungreis (U.S. Patent 6,881,509).

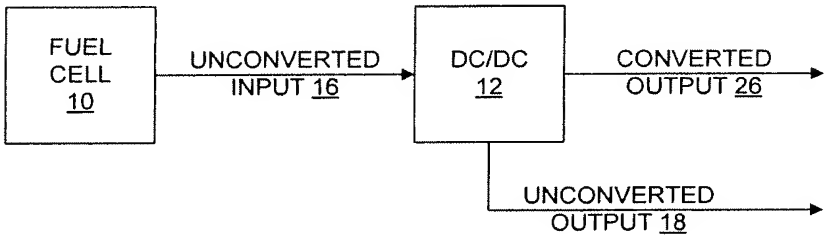
Claims 3 and 9 have been rejected under 35 U.S.C. § 103 as being obvious over Raiser and Jungreis in view of Chiao (U.S. Patent 7,119,454).

Claims 4 and 10 have been rejected under 35 U.S.C. § 103 as being obvious over Raiser, Jungreis and Chiao in view of Kuwayama et al. (U.S. Patent 6,125,798).

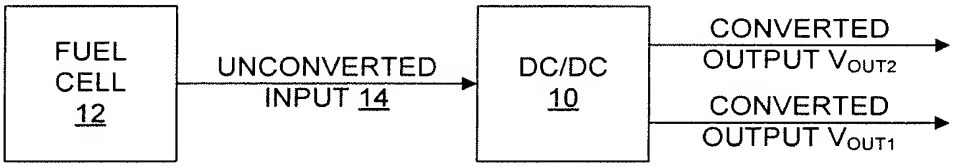
(vii) Argument

Rejection of claims 1, 2, 5-8 and 11 under 35 U.S.C. § 103 as being obvious over Raiser in view of Jungreis

In making this rejection, the Examiner has properly admitted that the DC/DC converter of Raiser "does not disclose a teaching of an output, which is unconverted" (Final Office Action, page 3, second paragraph, lines 5-6). Specifically, the following figure illustrates the invention of independent claims 1 and 6:

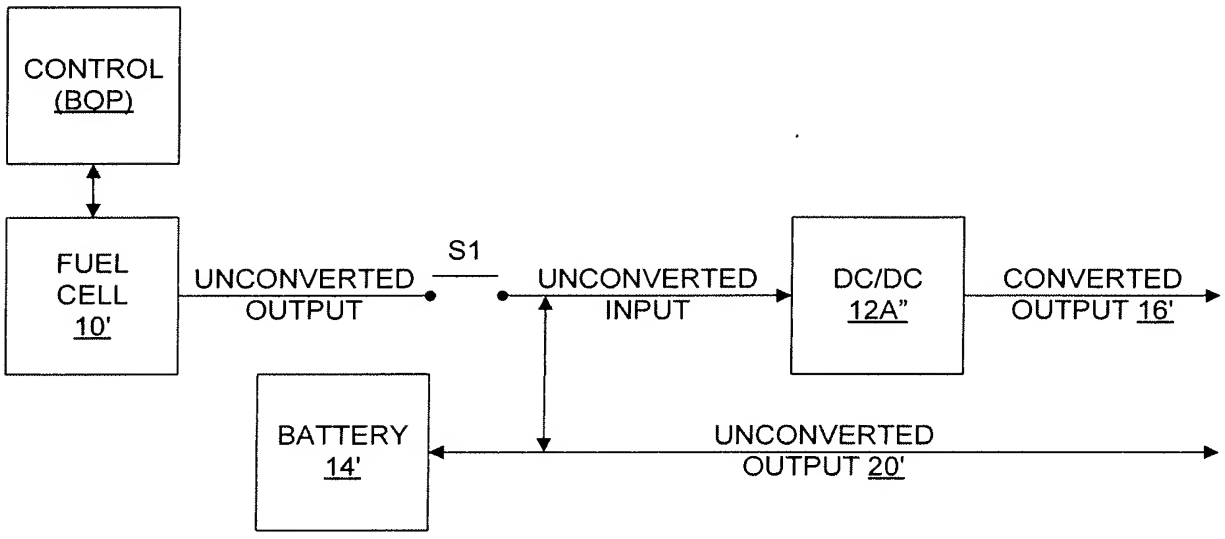


In contrast, the following figure illustrates the invention of Raiser (see Fig. 1 of Raiser):




Accordingly, the Examiner properly recognizes that Raiser fails to disclose, teach or suggest a "DC/DC [converter] having ... a second output for delivering unconverted electrical power," as required by independent claim 1; and "providing some of the electrical power delivered from the fuel cell auxiliary power unit to at least one electrical consumer via said DC/DC converter without conversion by the DC/DC converter," as required by independent claim 6.

The Examiner attempts to cure the admitted deficiencies of the Raiser reference by relying on Fig. 4 of Jungreis (Final Office Action, page 3, second paragraph, lines 6-8). However, Jungreis also is deficient with respect to a DC/DC converter having an output for delivering unconverted electrical power, as required by independent claims 1 and 6. Specifically, the following figure illustrates the invention of Jungreis (see Fig. 4 of Jungreis):



Accordingly, Jungreis also fails to disclose, teach or suggest a "DC/DC [converter] having ... a second output for delivering unconverted electrical power," as required by independent claim 1; and "providing some of the electrical power delivered from the fuel cell auxiliary power unit to at least one electrical consumer via said DC/DC converter without conversion by the DC/DC converter," as required by independent claim 6.

The Examiner attempts to cure the noted deficiencies in Jungreis by asserting that "the arrangement of parts to have the unconverted line pass through the converter module would have been obvious to one of ordinary skill in the art to *[sic]* in order to supply the load with the power that has not been converted in order to reduce the complexity of the power conditioning system thereby reducing the costs and increase the efficiency of the second output electrical power" (Final Office Action, page 3, second paragraph, lines 12-16).

However, the noted motivation not only is contrary to the teaching of Jungreis, but also is based on impermissible hindsight reliance on teachings found only in Applicant's disclosure, since Jungreis is no better than the admitted prior art referred to in applicant's specification, and suffers from the same problems noted there. Specifically, Applicant's invention of independent claims 1 and 6 recognizes that (emphasis added):

> [0008] The invention is developed in an especially useful manner in that the fuel cell is connected to one input of the DC/DC converter so that all the useful electrical power delivered by the fuel cell is supplied to this input and that some of the electrical power delivered from the fuel cell can be taken from the unconditioned output of the DC/DC converter without conversion by the DC/DC converter. In this way, **it is possible to connect the fuel cell only to the DC/DC converter**. Thus, **no additional circuitry measures are necessary in the area of the fuel cell**. The division of the voltage into a stabilized voltage on the one hand and an unstabilized or unconditioned voltage on the other occurs in the area of the DC/DC converter by transferring the unstabilized part only through the DC/DC converter and making it available at the unconditioned output of the DC/DC converter.

Here, Jungreis requires "additional circuitry measures ... in the area of the fuel cell," in the form of the BOP control and switch S1 circuits required for delivering the unconverted signal 20' external to the converter 12A".

Moreover, the motivation for modifying Jungreis asserted by the Examiner goes against the teachings of Jungreis. Specifically, Jungreis states at col. 3, lines 58-67 (emphasis added) that:

> Furthermore, **the [DC/DC] conditioner shown in FIG. 4 also only needs to operate from a small range of input voltages, thus simplifying the design of that conditioner**. The circuit of FIG. 4 additionally removes the necessity of coordinating two power conditioners with each other, or coordinating any power conditioner with the fuel cell stack--instead, **the dc-to-dc converter 12A" of FIG. 4 only needs to regulate the output voltage** regardless of the fuel cell stack's operational status. The **cost and complexity of the system is therefore much reduced** from the system shown in FIG. 2.

Therefore, on the one hand, Jungreis fails to provide the asserted motivation cited by the Examiner to justify Applicant's rejected claims, and on the other hand, Jungreis expressly teaches away from routing the unconverted power to the load via the DC/DC converter. Moreover, given the simplicity of Jungreis' circuit, it is not seen how the Examiner can properly contend that it would be obvious to depart from the express teachings of the Jungreis patent (that the patentee attributes as achieving simplification and cost reductions) by taking the unconverted power from the DC/DC converter when there is no evidence (outside of the present application) that such would achieve any reduction in complexity or costs or any increase in efficiency as opposed to defeating reduction in complexity and reduction of costs achieved by Jungreis' circuit. Put another way, since Jungreis is seeking a reduction in complexity and a reduction of costs, if it were apparent that such could be obtained simply by directly connecting the power source to the DC/DC converter, why wouldn't he have done so, or at least noted the possibility of being able to do so?

It is only Applicant's disclosure that teaches to provide a converted and an unconverted voltage via the DC/DC converter, because, as noted in paragraph [0008], it "is possible to connect the fuel cell only to the DC/DC converter" so that "no additional circuitry measures are necessary in the area of the fuel cell." Thus, the present invention obtains an improvement in a manner not taught or suggested by Raiser and Jungreis, and any proper application of Jungreis patent to Raiser would result in an arrangement in which an auxiliary

power tap is provided upstream of Raiser's DC/DC converter, which would still have two power outputs for providing two different converted voltages.

Therefore, it is submitted that the Examiner's proposed modification of Raiser and Jungreis would not have been obvious to one of ordinary skill based upon anything found in either of these two references, but rather is based on impermissible hindsight based solely on teachings from Applicant's disclosure. Accordingly, claims 1 and 6 have not been rendered obvious by anything that can be derived from the applied references, whether taken alone or in combination.

The rejection of claims 2, 5, 7-8, and 11 suffers from the same deficiencies of the Raiser and Jungreis noted relative to claims 1 and 6 from which they ultimately depend. Accordingly, claims 2, 5, 7-8, and 11 are also patentable over these references, whether taken alone or in combination.

Rejection of claims 3 and 9 under 35 U.S.C. § 103 as being obvious over Raiser and Jungreis in view of Chiao

The rejection of claims 3 and 9 also suffers from the deficiencies of the Raiser and Jungreis noted relative to claims 1 and 6 from which they ultimately depend since Chiao does not teach providing an unconverted voltage via a DC/DC converter instead of directly from the fuel cell at a point upstream of the DC/DC converter as taught by Jungreis. Thus, even if the load taught by Chiao were used with the Raiser DC/DC converter modified in a manner consistent with Jungreis' disclosure, the present invention still would not be obvious from anything taught by these references, whether taken alone or in combination.

Rejection of claims 4 and 10 under 35 U.S.C. § 103 as being obvious over Raiser, Jungreis and in Chiao view of Kuwayama et al.

The rejection of claims 4 and 10 also suffers from the deficiencies of the proposed combination of Raiser and Jungreis relative to claims 1 and 6 from which they ultimately depend since Kuwayama et al. also does not teach providing an unconverted voltage via a DC/DC converter instead of directly from the fuel cell at a point upstream of the DC/DC converter as taught by Jungreis. Thus, even if the control taught by Kuwayama were used

with the Raiser DC/DC converter modified in a manner consistent with Jungreis' disclosure and with the load of the Chiao reference, the present invention still would not be obvious from anything taught by these references, whether taken alone or in combination.

Accordingly, claims 4 and 10 are not obvious over any of the applied references, whether taken alone or in combination.

Conclusion

On the basis of the foregoing, all of the Examiner's rejections should be reversed and such action is hereby requested.

The brief fee set forth in 37 CFR § 41.20(b)(2) is authorized to be charged to the Deposit Account No. 50-2478(002664-15) of the undersigned's firm in a separate paper that accompanies this Brief. However, should that paper be missing, this paragraph should be construed as containing such an authorization.

Respectfully submitted,

By: _____

David S. Safran
Registration No. 27,997

Customer No. 25570

Roberts Mlotkowski & Hobbes P.C.
P.O. Box 10064
McLean, VA 22102
Direct Telephone: (703) 584-3273

DSS:kmm

Claims Appendix

1. (Original) Vehicle electrical system, comprising:

- a fuel cell auxiliary power unit and

- a DC/DC converter for matching the DC voltage generated by the fuel cell to the voltage of the vehicle electrical system, the DC/DC having an input connected to an output of the fuel cell, a first output for delivering converted electrical power and a second output for delivering unconverted electrical power,

wherein at least one electrical consumer is connected to said second output so that some of the electrical power delivered from the fuel cell is supplied to the at least one electrical consumer without conversion by the DC/DC converter.

2. (Original) Vehicle electrical system as claimed in claim 1, wherein the at least one consumer is a high wattage consumer.

3. (Original) Vehicle electrical system as claimed in claim 2, wherein the at least one consumer is a compressor motor of an electrically driven air conditioning compressor of a motor vehicle climate control system.

4. (Cancelled).

5. (Original) Vehicle electrical system as claimed in claim 1, wherein the fuel cell auxiliary power unit has an electrical wattage of about 5 kW.

6. (Previously Presented) Process for operating an electrical consumer with electrical power, comprising the steps of:

delivering a DC voltage generated by a fuel cell auxiliary power unit to a DC/DC converter,

using said DC/DC converter for converting a portion of the DC voltage generated by the fuel cell auxiliary power unit to a voltage that is matched to the voltage of the vehicle electrical system,

providing some of the electrical power delivered from the fuel cell auxiliary power unit to at least one electrical consumer via said DC/DC converter without conversion by the DC/DC converter.

7. (Original) Process as claimed in claim 6, wherein

- the fuel cell is connected to an input of the DC/DC converter so that all the useful electrical power delivered from the fuel cell is supplied to the input of the DC/DC converter, and

- some of the electrical power delivered from the fuel cell (10) is taken from an unconditioned output of the DC/DC converter without conversion by the DC/DC converter.

8. (Original) Process as claimed in claim 6, wherein the at least one consumer is a high wattage consumer.

9. (Original) Process as claimed in claim 8, wherein at least one consumer is the compressor motor of an electrically driven air conditioning compressor of a motor vehicle climate control system.

10. (Original) Process as claimed in claim 9, wherein the wattage of the air conditioning compressor is controlled independently of the rpm of the compressor motor via the mechanical triggering of the compression stroke.

11. (Original) Process as claimed in claim 6, wherein the electrical wattage of the fuel cell auxiliary power unit is about 5 kW.

Evidence Appendix

None

Related Proceeding Appendix

None